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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Morency, *et al.*	Examiner:	Takeuchi
Serial No.:	10/583,183	Art Unit:	1793
Filing Date:	March 12, 2007	Conf. No:	8998
Title:	Hydrometallurgical Separation Process Of Steel Mill Electric Arc Furnace (EAF) Dust And The Pigments Obtained By The Process		

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

DECLARATION UNDER 37 C.F.R. § 1.132

I, Dr. Maurice Morency, declare and state as follows:

1. I am a named co-inventor in the above-identified application. I have a Ph.D., and am Vice-President, Research and Development, of the assignee, Ferrinov Inc.

2. I am familiar with the claims, and have read the Office Action mailed June 14, 2010, in the above-identified application. I am also familiar with the response concurrently being filed with this Declaration in reply to the outstanding Office Action.

3. This Declaration describes the results of experiments that were conducted under my supervision. These experiments were designed to compare the performance of three surfactants (and a control without surfactant) in the context of the claimed methods. The results of these experiments are presented in the form of eight photographs which are attached hereto and discussed in more detail below.

4. Four (4) samples of steel mill electric arc furnace (EAF) dust were prepared and tested. All four samples were taken from the same batch of EAF dust that was obtained from our pre-commercial plant.

5. The amount of EAF dust used in each sample was identical. 160 grams of EAF dust was initially added to 1000 ml of water to form a slurry. The slurry was then mixed for 15 minutes with a standard laboratory mechanical mixer at relatively high speed using a baffle to induce turbulence and strong agitation. The surfactants were diluted in 100 ml of water, then added to the slurry in the last two minutes of agitation. The samples were decanted for 5 days after which time the attached photos were taken.

Sample No. 1: Slurry mixed and decanted without any added surfactant.

Sample No. 2: Slurry mixed and decanted with 1.5% (w/w) sodium meta phosphate.

Sample No. 3: Slurry mixed and decanted with 1.5 % (w/w) Saratan LS (a sulfonate surfactant supplied by Handy Chemicals, Ltd.).

Sample No. 4: Slurry mixed and decanted with 1.5 % (w/w) Disal VP (a sulfonate surfactant supplied by Handy Chemicals, Ltd.).

6. A total of eight (8) photos were taken of these samples after they had been decanted: four (4) profile photos of the tilted beakers to show the frosted wedge on the inside glass wall of the beaker and four (4) photos of the top surface of the liquid to show the accumulation of a whitish thin crust of solids which is mostly calcium compounds.

7. The photographs of Samples 1, 3 and 4 (which lacked a phosphate) show (a) a wedge area between the original surface and the tilted surface with a frosted glass wall resulting

from the deposition of solid material and (b) a floating whitish thin crust of solid at the surface. These features developed gradually over the 5 days of decanting. The thin film lining the inside of the beaker cannot be removed easily either by rinsing or by scrubbing. These solid material deposits are presumed to be of the same material that we have found to clog the screens used in several of our processing stations and which can only be removed with frequent acid cleaning.

8. The photographs of Sample 2 (which included a phosphate) show a slurry that (a) does not display a frosted or coated deposit on the beaker wall and (b) does not display a floating film at the surface. These results demonstrate that the presence of the phosphate is preventing the formation of the solid materials that were observed in Samples 1, 3 and 4. Without wishing to be limited to any particular theory, it is thought that the phosphate is preventing calcium from leaching out of the solids (i.e., sequestering calcium compounds) and may also be transforming the calcium already in solution into phosphate compounds that decant with the slurry.

9. The photographs also show that despite using the same amount of initial EAF dust, the decanted slurry of Sample 2 had a greater final volume than the decanted slurries of Samples 1, 3 and 4. This can be seen in the increased thickness of the decanted layer at the bottom of the beaker for Sample 2 (about 285 ml) as compared to Samples 1, 3 and 4 (between 225 and 250 ml). Without wishing to be limited to any theories, these observations are thought to be related to the different dispersing properties of the surfactants. Specifically, the surfactants are thought to modify the surface characteristics of the particles which in turn affects the level of repulsion between solid particles of the same phase. The increased volume seen with Sample 2 demonstrates that the phosphate is more effective at dispersing

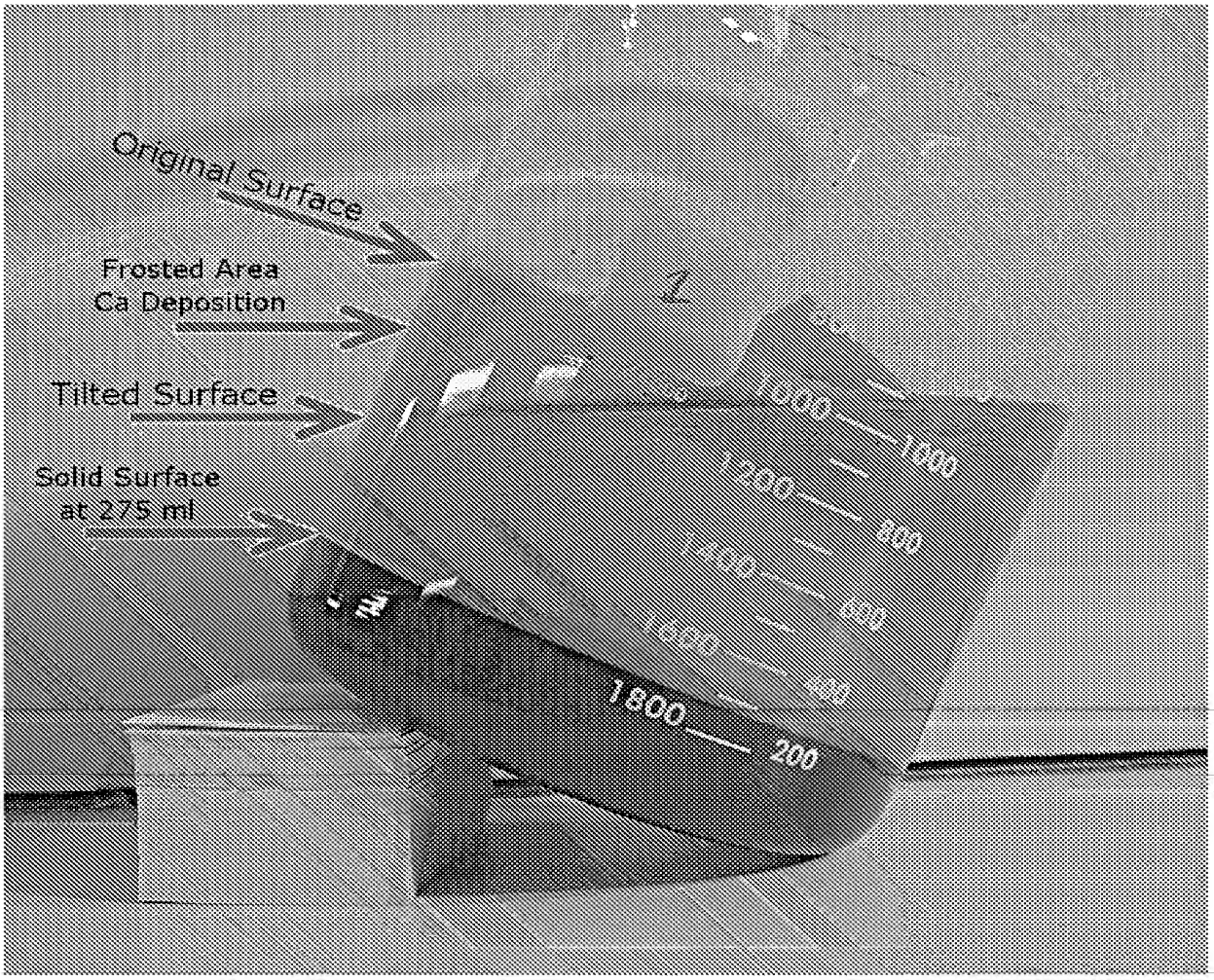
the particles than the other surfactants. This has the advantage of yielding a fluffier, less dense, decanted slurry, which in turn is easier to fractionate with physical means like screens and magnetic drum separators. The less condensed state of the slurry in Sample 2 is also thought to explain the circular ridge like fractures that are observed at the surface of the slurry (see photograph on page 8 showing the surface of the clear liquid when viewed from above).

10. I, Maurice Morency, declare that all statements made herein of my own knowledge are true and that these statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful, false statements and the like are made punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code and that such willful, false statements may jeopardize the validity of the application or any patents that may issue thereon.

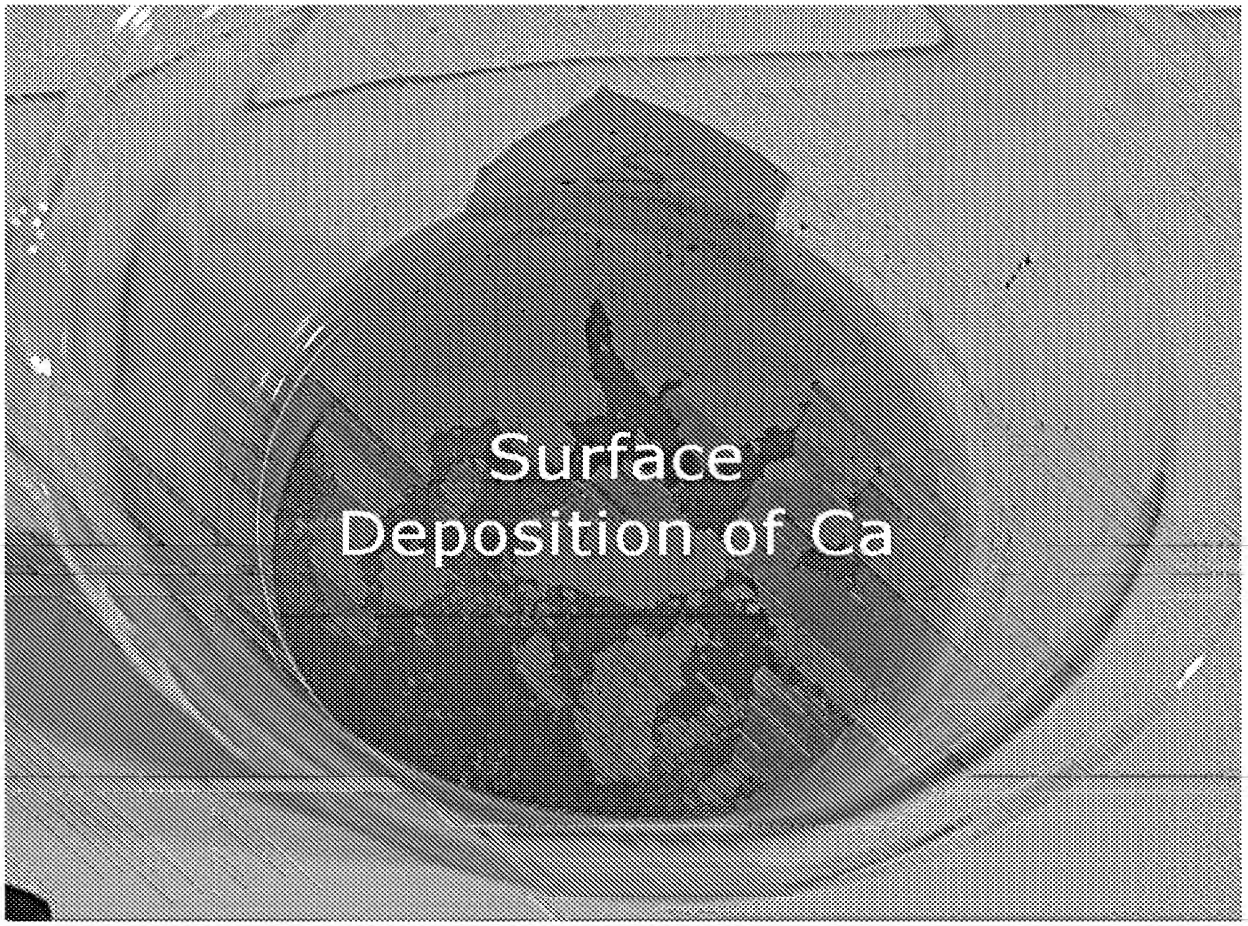
Maurice Morency

13/09/2010

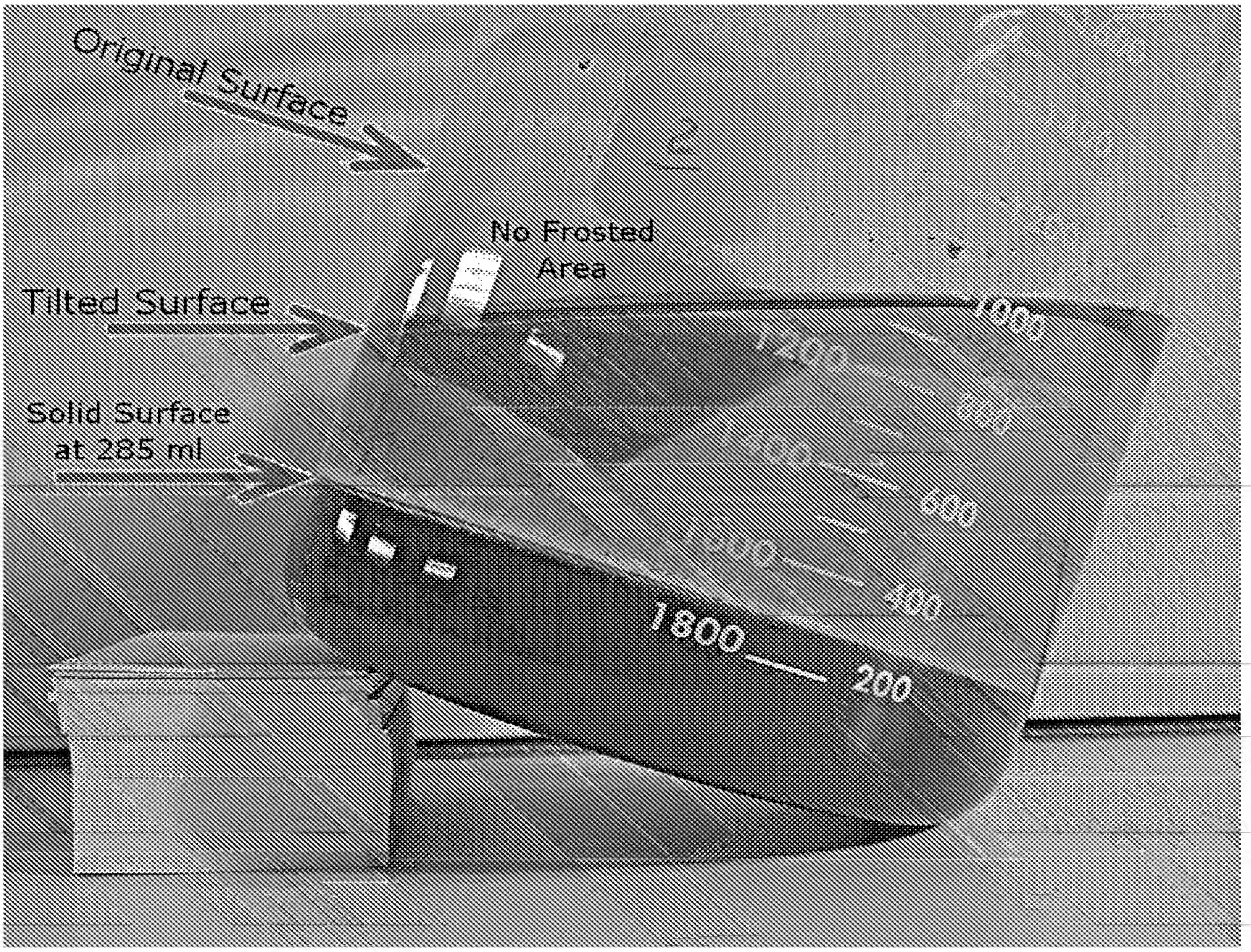
Date



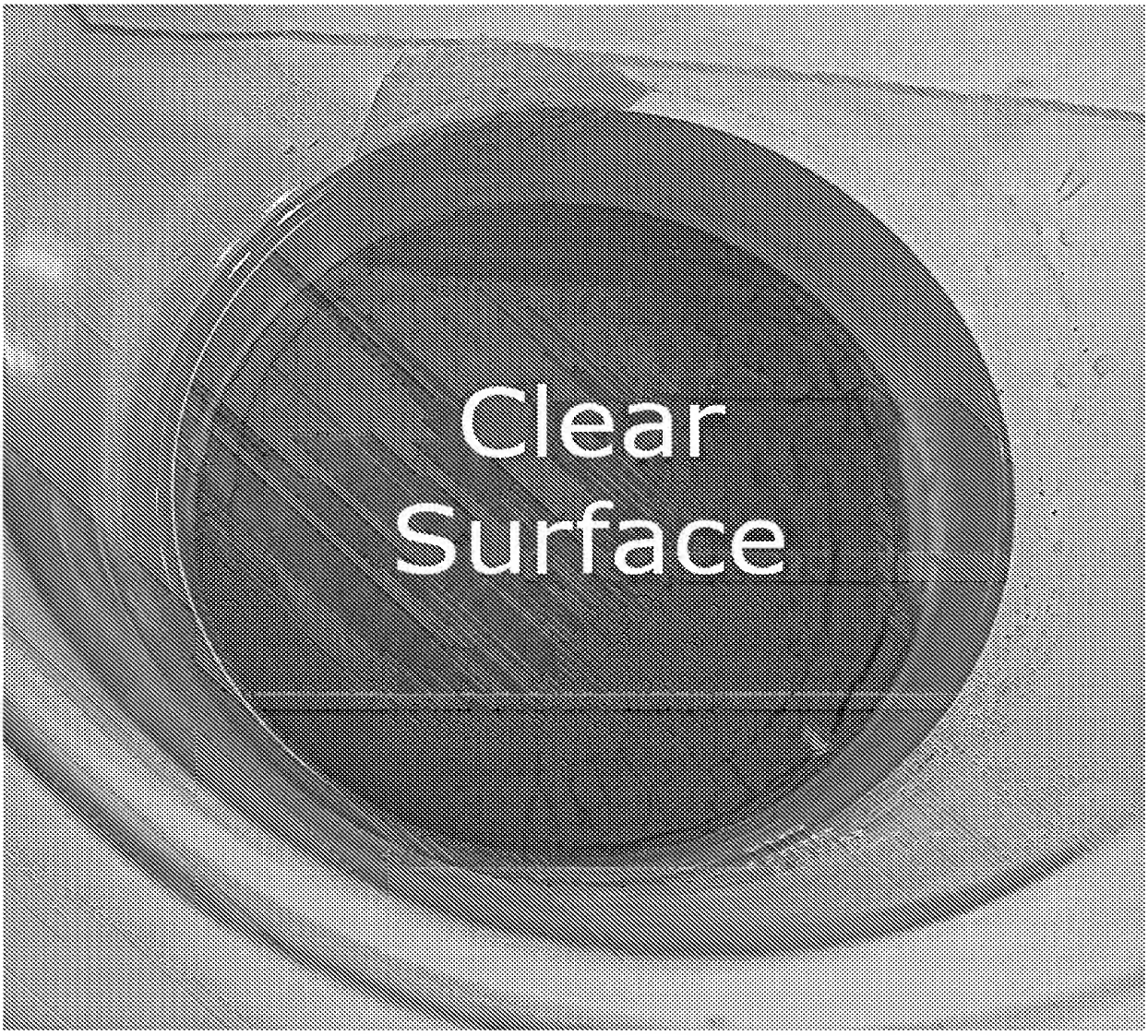
Profile Photo Experiment #1



Surface Photo Experiment #1



Profile Photo Experiment #2



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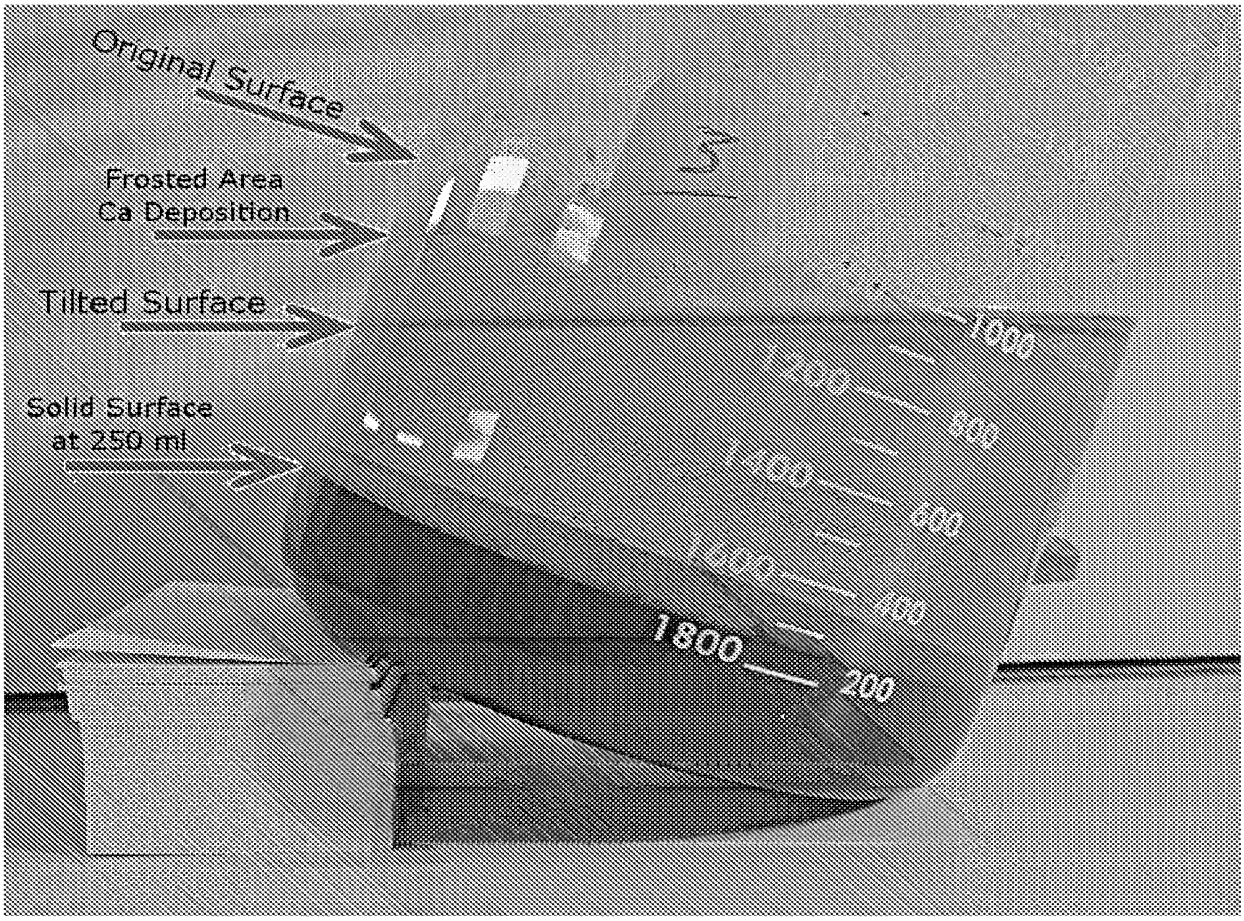

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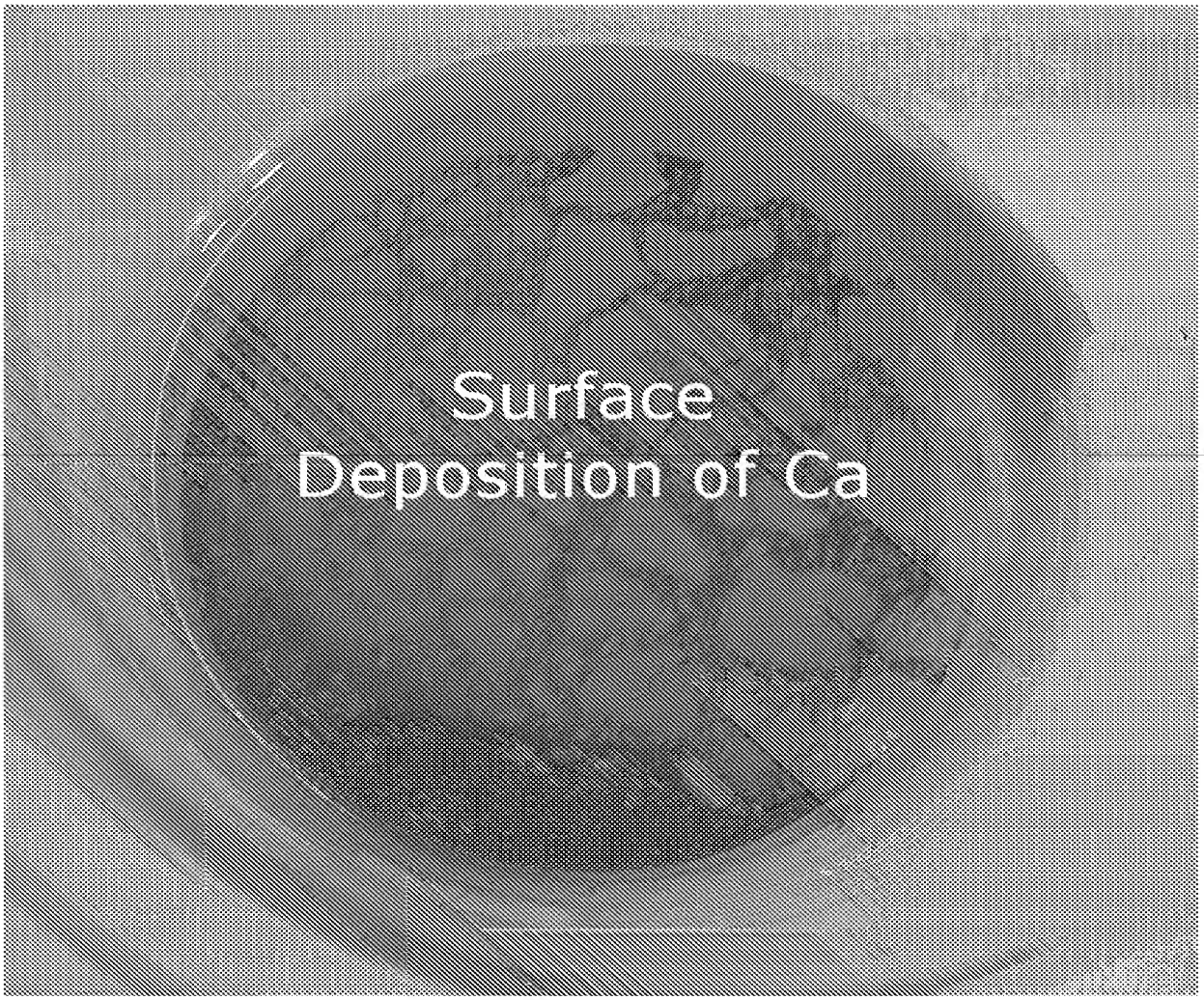

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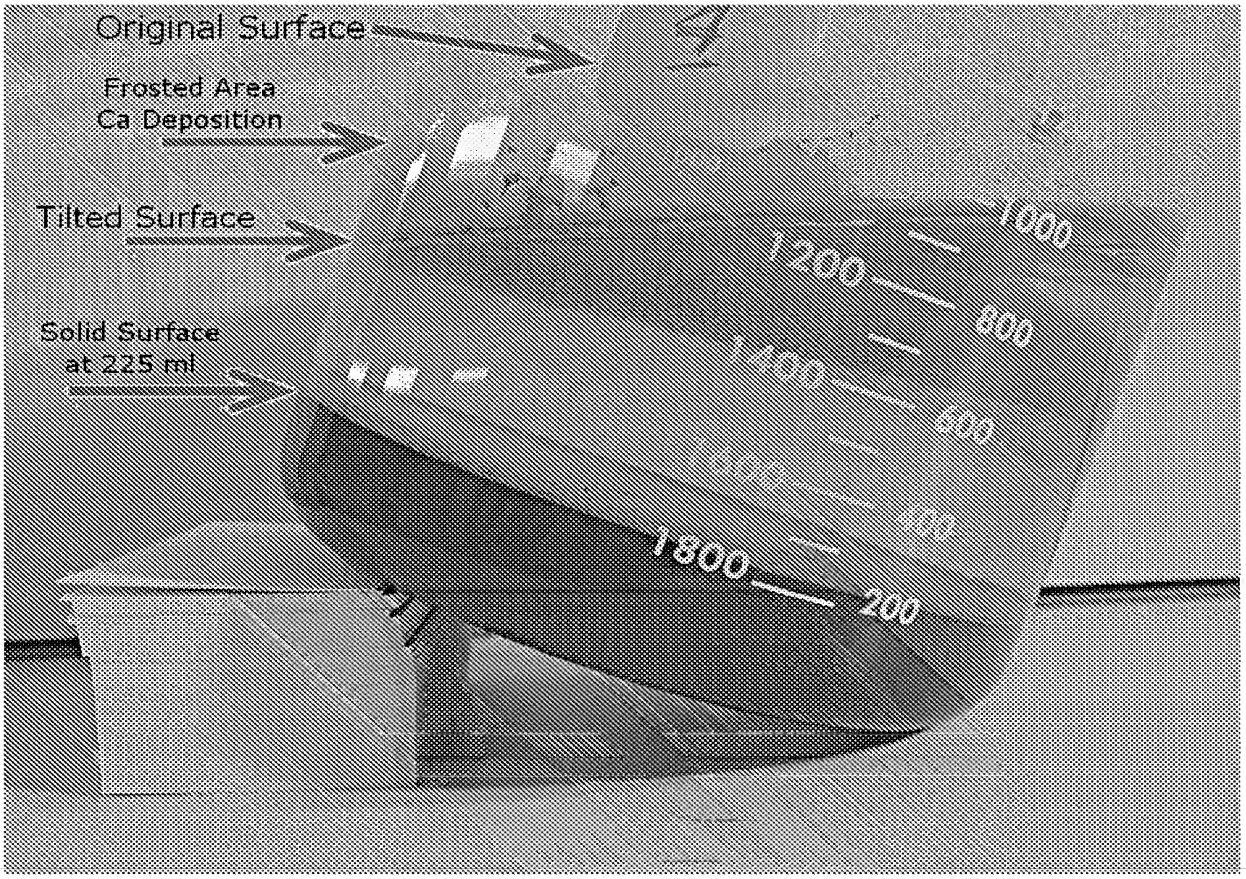
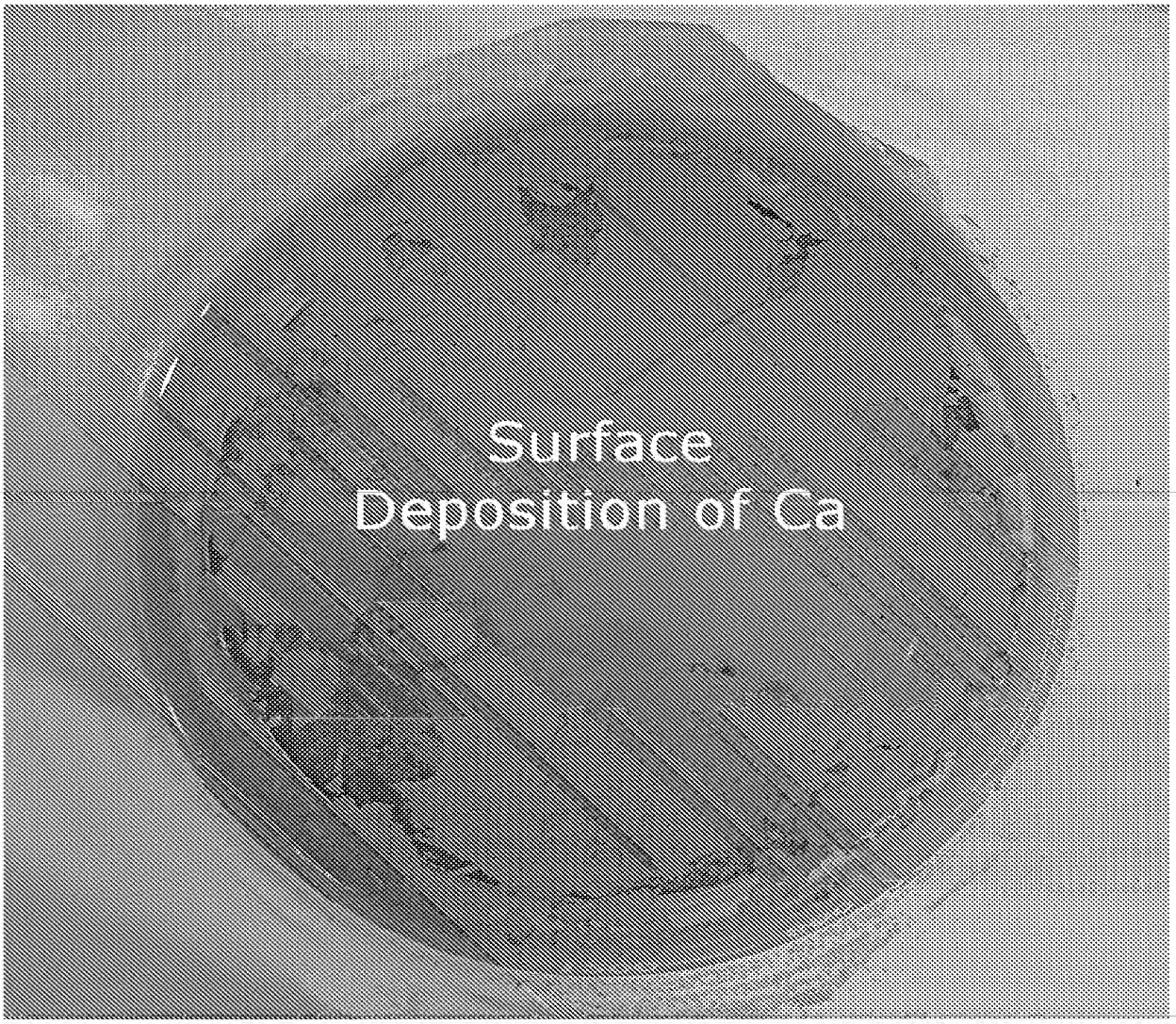


Profile Photo Experiment #4



Surface Photo Experiment #4